

Remarks

Claims 8, 10, 13, 14, 17, 28 and 29 are now pending.

Independent process claim 1 has been cancelled and replaced with new process claim 28.

The Rejection

The following patents have been relied upon to reject various of the Applicant's claims:

U.S. Patents

Weber, et al.	4,431,755 (Weber)
Hergenrother, et al.	6,525,118 (Hergenrother)

The Applicant's claims, prior the amendments and revisions made herein, have been rejected under 35 U.S.C. Section 103(a) as being unpatentable over Weber in view of Hergenrother.

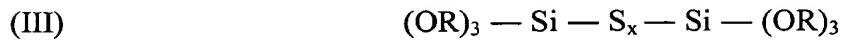
The Invention

It is important to appreciate that the invention of the Applicant's revised claims is directed to a process of preparing a rubber composition which contains exfoliated smectite clay wherein said clay is intercalated and exfoliated in situ within an elastomer host;

wherein a symmetrical coupling agent is mixed therewith subsequent to said intercalation of said smectite clay and after at least a partial exfoliation of said intercalated clay to form exfoliated clay platelets, and

wherein said symmetrical coupling agent is a bis(3-triethoxysilylpropyl) polysulfide having an average of from about 2 to about 2.6 or from about 3.5 to about 4 connecting sulfur atoms in its polysulfidic bridge.

The Applicant's coupling agent is a symmetrical coupling agent which may be represented by the general formula (III):

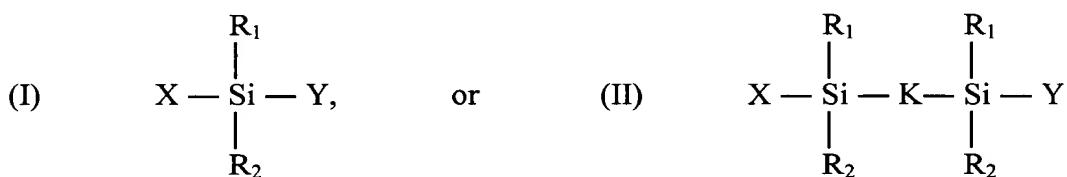


wherein R is an ethyl radical, the (OR) being an ethoxy group, and x is an average of

from about 2 to about 2.6, or about 3.5 to about 4, representing the connecting sulfur atoms in its polysulfidic bridge.

Discussion

The cited Weber reference relates to preparation of a rubber composition which, in one aspect, is prepared as a mixture of clay (which can be, for example, montmorillonite clay), quaternary ammonium salt and an unsymmetrical organosilane. In particular, the unsymmetrical organosilane required by Weber is required to be of formula (I) or (II), namely:



wherein X is a group which, upon hydrolysis, forms a group which is capable of reacting with a site on the clay so as to form a bond between the organosilane of Formula (I) or (II) and the clay particles. Preferably X is a group which upon hydrolysis forms a hydroxyl group. More preferably X is selected from the group consisting of a halogen moiety and OR₁₃ wherein R₁₃ is an alkyl group containing from 1 to 20 carbon atoms such as for example 2-methoxyethoxy and 2-(methylamino)-ethoxy and similar radicals;

wherein Y is an alkyl, aryl or alkyl substituted aryl group;

wherein R₁ and R₂ are the same or different selected from the groups represented by X and Y, an alkyl group containing from 1 to 20 carbon atoms, an aryl group and an alkyl substituted aryl group;

wherein K of formula (II) is an alkenyl group containing from 1 to 20 carbon atoms, or an alkyl sulfide or polysulfide group containing from 1 to 6 sulfur atoms and from 2 to 20 carbon atoms.

The Weber reference is materially deficient for rejecting the Applicant's revised claims as being obvious under the requirements of 35 U.S.C. Section 103(a).

In particular, the bis(3-ethoxysilylpropyl) polysulfide required by the Applicant's claims 28 and 29 is clearly exclusive of the Formula (I) organosilane of Weber which is unsymmetrical and does not contain a polysulfide moiety. In particular, the bis(3-ethoxysilylpropyl) polysulfide required by the Applicant's claims 28 and 29 is exclusive of the Formula (II) organosilane of Weber which is unsymmetrical, does not contain the Applicant's required symmetrical (OR)₃ groups and requires the presence of its R₁ and R₂ substituents.

Further, Weber reference does not teach or suggest a sequential mixing aspect of the Applicant's revised method claim 28 wherein the specific bis(3-triethoxysilylpropyl) polysulfide coupling agent is mixed subsequent to said intercalation of said smectite clay and after at least a partial exfoliation of said intercalated clay to form exfoliated clay platelets.

Accordingly, it is contended that a *prima facie* case of obviousness of the Applicant's revised process claims 28 and 29, as well as claim 17 directed to a tire with a resulting tire tread composition would not be made out by the Weber reference, alone, under the requirements of 35 U.S.C. Section 103(a).

The Hergenrother reference does not remedy the aforesaid material deficiencies of the Weber reference. The Hergenrother reference is apparently cited to show a diene rubber based rubber composition, which can be used to make tire articles such as tire treads, which contains carbon black and/or silica together with a silicate such as clay or mica.

Nowhere in Hergenrother is the process of the Applicant's claims 28 or 29 or the tire tread claim 17 taught or suggested. Nowhere does Hergenrother teach or suggest the use of any process of utilization of either of the Formula (I) or Formula (II) organosilanes of Weber. Nowhere does Hergenrother teach or suggest the use of the Applicants required process of the Applicant's claims 28 and 29 involving the combination of addition of the symmetrical bis(3-triethoxysilylpropyl) polysulfide taken with the specialized addition of the

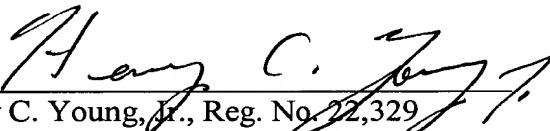
bis(3-trethoxyhsilylpropyl) polysulfide after the intercalation of the montmorillonite and/or hectorite clay and after at least a partial exfoliation of the intercalated clay.

Accordingly, it is contended that the combination of the Weber and Hergenrother references does not make out a *prima facie* case of obviousness of the Applicant's revised claims, and particularly process claims 28 and 29 as well as product claim 17 in view of the requirements of 35 U.S.C. Section 103(a). It is contended that a rejection of the Applicant's revised claims based upon the combination of the Weber and Hergenrother references would require a significant hindsight and would require a significant reconstruction of both of the Weber and Hergenrother references in full view of the Applicant's own specification and claims.

Conclusion

In view of the revisions made to the Applicant's claims and comments herein it is contended that Applicant's claims are not obvious in view of and patentably distinct from the combination of the Weber and Hergenrother references under 35 U.S.C. Section 103(a).

Respectfully submitted,


Henry C. Young, Jr., Reg. No. 22,329
Attorney for Applicants

The Goodyear Tire & Rubber Company
Department 823
1144 East Market Street
Akron, Ohio 44316-0001
Telephone: (330) 796-2956